Toward a Vision of Elementary Teaching and Learning

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Introduction

Teachers are the backbone of elementary schools. With the exception of parents, they are the adults that spend the most time with children. It is the task of the teacher to figure out how to help move every child in their class forward in their intellectual, social, ethical, and physical development. Teachers perform much of this task by making decisions, literally hundreds of them every day. These decision include things like: what activities their students actually do, what their students talk about in class, how they talk together, which problems from last night's homework assignment are discussed by the class, how classroom rules are made, what the consequences are for breaking one of those rules, who needs extra attention today, which behaviors should be ignored for awhile, how curriculum can be adapted for a certain group of learners. The list goes on and on. Some decisions are "big" ones, while others seem rather "small." However they all impact on the learning that goes on in a classroom.

In this era of heightened expectations, declining resources, and powerful stresses on all of our social institutions, it will be helpful to be clear about what elementary schools and elementary teachers should do, so that teachers, administrators, professors of education, parents and other concerned community members can focus on providing excellent teaching and learning for our elementary students. This monograph lays out such a framework for thinking about elementary education. It focuses on the goals of education and on essential knowledge and skills that teachers should have in order to work effectively toward those goals. It does not prescribe one "approved" way to achieve the goals. There are many ways to achieve them. Teachers and other educators work together to develop coordinated strategies to best meet the needs of specific students in specific schools for specific years.

The monograph brings together themes from current research, student and teacher standards in various content areas, and exemplary practice to present a vision of elementary teaching and learning that is designed to meet the challenges of the twenty-first century. The vision itself is described in terms of experienced teachers, and is clearly beyond the abilities of most beginning teachers at the present time. However, it identifies the important ends toward which they must

work. It stems from an effort to lay a foundation for building a support and assessment system for beginning elementary teachers. Hopefully, it can also serve as a focus for reflection on teaching and learning for practicing teachers and administrators.

The actual functioning of any elementary school in Connecticut appears to be a widely varying kaleidoscope of activities. As we focus on the actions of teachers, we see that there are two factors that have served to make teachers' responsibilities greater and their decisions more difficult and complex in recent years: curriculum reform and proliferation of responsibilities.

With national, state, and local curriculum reform efforts in multiple content areas, elementary teachers are facing difficulties in figuring out what to teach and how to teach it. The number of recommendations applicable to elementary schools require more time than is available in a school year, leaving it up to elementary teachers and administrators to set priorities. Many districts find themselves urged by national reform efforts to emphasize inquiry and other thinking processes, while parents and local boards demand more emphasis on basic skills. The many calls for higher educational standards do little to address the issue of students' preparation to meet the standards. They offer little guidance to teachers on how to meet the needs of students who lack broad exposure to literacy and numeracy. They also fail to address the needs of students for whom usual grade level expectations offer little challenge.

As the impact of many American social institutions has declined during the last half of the century, the responsibilities of schools have risen. Elementary schools assume a variety of responsibilities every day, such as providing health care and day care, counseling citizens about parenting, teaching students to read and write, and helping students keep physically fit. Local, state, and federal regulations require teachers to do everything from teaching specified skills at specified grade levels to implementing anti-drug education to developing and carrying out individual education plans for special needs students. In addition, elementary teachers teach multiple subjects. A teacher with a self-contained class might easily have between eight and twelve "lesson preparations" per day.

This monograph aims to assist elementary teachers and other educators in navigating the sea of educational reform and proliferation of school responsibilities by offering a coherent vision of elementary teaching and learning. It aims to help elementary teachers and schools see priorities and connections across the various reform efforts and among multiple responsibilities. It will be a basic tenet of the monograph that teachers make many decisions that have powerful effects on how well students learn. These decisions become more crucial in an era of declining fiscal resources where difficult choices must be made. Having a clear vision of the work of the elementary school helps teachers clarify and improve their decisions.

The major ideas of the monograph can be summarized in the following diagram:

Teachers Draw upon their	to	Facilitate Student Learning by	in order to	Fulfill the Five Central Responsibilities of Elementary School
Knowledge of Content and Knowledge of Students From Developmental Perspectives From Individual Perspectives From Socio-Cultural Perspectives		Structuring the Classroom Environment Selecting Tasks Facilitating Discourse Reflecting on and Analyzing their Teaching Collaborating with Others		Promote Literacy Develop Numeracy Encourage Inquiry Build Citizenship Skills Foster Habits of Mind

Five Central Responsibilities of the Elementary School

We have identified five responsibilities that are central to the decision making that elementary teachers must engage in. They form the core of the design of curriculum.

The five central responsibilities of elementary schools are to:

- PROMOTE LITERACY, so that students can communicate effectively.
- DEVELOP NUMERACY, so that students can solve problems related to quantity and space.
- ENCOURAGE INQUIRY, so that students can expand their knowledge in all fields of learning.
- BUILD CITIZENSHIP SKILLS, so that students can contribute to the various communities to which they belong.
- FOSTER THE HABITS OF MIND THAT SUPPORT LEARNING, so that students can be independent, lifelong learners

Literacy is the ability to communicate to others and to make sense of communications from others so that common meanings are constructed. Reading, listening and viewing are the processes we use to make sense of the communications we receive from others. Writing, speaking and enacting are the ways we communicate to others. Literacy enables people to perform many cognitive tasks including, but not limited to, learning and inquiring, problem solving, making plans and taking action. Teaching and learning depend upon accurate communication, comprehension, and interpretation.

No matter what the specific situations or conditions, societies always need citizens who can solve problems using numeracy. Mathematics provides essential tools for inquiry and problem solving. The concepts and skills of mathematics help students to be able to comprehend numbers, analyze and interpret data, make measurements, estimate and calculate quantities, understand spatial relationships, and to reason mathematically and logically. Empowered students are always recognized by their abilities to think strategically and to use mathematics knowledge to solve real world problems.

Inquiry is fundamental to independent learning in all subjects taught in elementary schools, including those not usually thought of as "academic" subjects, such as art, music, and physical education. It allows students to make new discoveries, extend their knowledge, or to deepen their understandings of what they already know. Elementary schools need to provide students with repertoires of tools of inquiry that allow them to imagine and experiment with alternatives, carry out increasingly complex searches for information, and to perform more sophisticated analyses of their findings. For all areas of inquiry, students need to be able to create, observe, compare, question, record and interpret data, evaluate and revise, search other resources and references, and share ideas and information. Inquiry is fostered in elementary schools by encouraging students to wonder about natural and human phenomena, to ask their own questions, and to develop and practice those concepts and skills that help them explore answers to their questions and the questions of their classmates.

A democratic society needs people who will make positive contributions to social, economic, political, and cultural life, i.e., enact citizenship. Elementary schools are the social institutions that collaborate with families to foster the growth of the skills and attitudes that help students to be both able and willing to participate in society. Individually, students must learn to take responsibility for their work and actions. In a social context, students must be able to work effectively as members of various groups. They should be able to see issues from different perspectives, to collaborate, to negotiate, and to exercise judgment to make informed decisions. In addition to developing a sense of themselves as individuals, students also need to develop a sense of belonging to groups such as their classroom, community and nation. These attitudes and capacities enable people to make contributions for the good of the whole society.

The final test for schools is the extent to which their graduates apply their skills, knowledge and understandings to real world situations, which requires certain habits of mind. These habits of mind are attributes which have become an integral part of the way that students approach the world. They are necessary, though not sufficient, for independent learning to occur. Do students persevere? Do they have the confidence to carry out problem solving strategies even though they don't know what the outcome might be? Are they willing to subject their work to evaluation by others? Will they think independently to the extent needed for leadership and creativity? Can they adapt their behaviors to better meet new and different situations? Are they open to learning new ideas and developing more complex insights? Are they willing to be self-reflective, able and willing to assess strengths and weaknesses?

These habits of mind enable people to use their abilities for effective action in the world. While elementary schools certainly do not bear the entire burden of fostering these habits, there is an

expensive price to pay when they do not pay attention to these important outcomes as they teach. If elementary schools treat their young students without any regard to their eventual willingness to use their education, those habits of mind may be impaired beyond the capacity of secondary schools to save.

These five central responsibilities are interconnected. Students can apply their literacy and mathematical skills and processes to learning in all subject areas. Teaching and learning about inquiry processes often depends on the development and application of citizenship skills related to working in groups. Complex learning is highly dependent on appropriate habits of mind. Teachers and students don't experience these responsibilities as separate parts of the curriculum; elements of the responsibilities merge together in daily activities that capitalize on connections between them. These holistic connections help teachers manage the diverse elements of the different content areas that compose the elementary curriculum by working on multiple central responsibilities simultaneously. Teachers also use these connections to build motivation for developing constructive habits of mind, and to inspire students to model good citizenship and ways of coping and behaving. The ways in which teachers choose to do this will vary both with their individual creativity and with the needs of their particular students.

The five central responsibilities set forth priorities for the content of elementary school. However, teachers do not teach content only, they also teach students. Therefore, we next outline priorities for what teachers need to know about students.

Knowing About Students

Teachers are aware that many factors affect their students and how they learn. These factors include, but are not limited to, students' ages, abilities, health, feelings toward learning, specific skill levels, previous experiences, personal interests, and personalities. Because these forces exert such powerful influences on learning, teachers use a variety of perspectives to think about their students and the resources they bring to their own educations. In particular, they know their students from:

- DEVELOPMENTAL PERSPECTIVES, so they can attend to students' cognitive, social, and physical growth;
- INDIVIDUAL PERSPECTIVES, so they can build on the frameworks and skills that their students use to understand the world;
- SOCIO-CULTURAL PERSPECTIVES, so they can understand and interpret a student's ideas and actions.

Developmental perspectives help teachers understand where students are in relation to where they are to go. Students' understandings often emerge through different stages, which they pass through at varying rates of speed. For instance, the ability to read emerges over time through many stages of development. Knowing that print carries meaning, that print corresponds to spoken language, and that specific symbols correspond to specific sounds are among the understandings that readers pass through as they learn to read. Teachers understand how students work and express themselves at

different developmental stages of understanding associated with learning mathematical, scientific, language, artistic, and other processes.

Children come to school already practiced in making sense of their world. They developed this ability naturally as they interacted with others in their environment. Sometimes their understandings are accurate; sometimes they aren't. Regardless, they have structured their knowledge and understandings into frameworks that are meaningful to them, rather than retaining them as discrete bits of information that exist independently of each other. As new information is considered, it is placed within these frameworks to make it meaningful and useful. Learning takes place when these prior frameworks are challenged or reinforced by new information requiring the learner to actively integrate the new information with the old. When the learner does not possess or is unable to access the particular framework needed to assimilate the new ideas, learning does not occur. Teachers use their knowledge of their students to provide appropriate learning experiences that are neither too difficult nor too easy. These experiences build bridges between students' previous knowledge and experiences and the learning goals.

Teachers are also familiar with typical patterns of student behavior at various ages, both with respect to individuals and with respect to groups. Students experience significant social, emotional, and physical changes during the elementary years. They are engaged in developing the abilities to interact in productive and appropriate ways with peers and adults, to sustain their attention for increasingly longer periods of time, and to exert greater control over their bodies and minds. For example, "independent behavior" or "working together" would each look different in a kindergarten classroom than they would in a fourth grade class. Primary students' letters tend to be larger than intermediate students' because they are still developing the fine motor skills necessary to control their writing. Among other things, teachers use this knowledge to set appropriate expectations for student work, and to develop with their students an understanding of standards for appropriate behavior in the classroom.

Teachers use individual perspectives to help them build upon the different ways that students learn about the world. Some learn visual materials best, while others do better with auditory presentations or the manipulation of concrete materials. When the material to be learned is difficult, students may learn better when teachers provide experiences or represent information in their preferred learning mode. When the material is less difficult, students might benefit by being challenged to develop their capabilities in non-preferred ways of accessing information. In either case, knowledge of these preferences affects teaching decisions.

Students have different ways of interacting with their world. Some students are outgoing; others are shy. Some students are flexible; others cling tightly to old ideas or habits. Teachers can read nonverbal and verbal cues from students to inform their interactions with students. Recognizing defensive, manipulative or helpful behaviors in their various expressions helps teachers accurately assess their students' readiness to learn. Teachers understand the close relationships of the cognitive and emotional aspects of their students' lives.

Teachers also use socio-cultural perspectives to understand their students. They know how cultures and other social groups differ in critical norms and values that affect student learning. These include such factors as language use, norms of interaction, gender-based expectations, and parental

contributions to their children's education. They are familiar with the community in which they teach and the ways in which members of the community make use of literacy, numeracy, and other knowledge taught in school. Rather than treating students in a stereotypical fashion, they use this knowledge to sensitize them to alternative interpretations of ideas and behaviors. Information gathered from this and other perspectives informs the consideration of alternative means of promoting literacy, developing numeracy, encouraging inquiry, building citizenship and fostering habits of mind to support lifelong learning.

Teachers are also familiar with student cultures at their school. They know where each of their students fits into the different types of friendship networks within the school. They know how current fads in popular culture can influence student behavior in both positive and negative ways. They know how the embracing of particular community roles (e.g., the intellectual, the jock, the joker) affects individual student motivation and the willingness to learn. They know how and when to use these influences to motivate and guide student learning and how to guard against their interfering with student development.

The challenging job of trying to meet the needs of students is made more formidable because teachers do not teach individuals. They teach a whole classroom of students with different needs. Teachers vary and adjust presentations and activities so that they are responsive to individual needs in the context of a cohesive group of students who do many activities together in their shared classroom.

Teachers remember that knowing their students is not an end in itself. They use this knowledge to help their students learn. More specifically, knowledge of students from particular perspectives informs the decisions teachers make about how they implement their five central responsibilities.

Teaching Toward the Five Central Responsibilities

Young learners tend to be bound by their sensory perceptions, their individual perspectives, and their immediate surroundings. Fulfilling the five central responsibilities requires helping students to go beyond their own experiences. Elementary teachers do this by providing students with opportunities to develop the ideas, thinking processes, and skills needed to read, write, create images, solve problems, conduct inquiry, contribute to groups, and eventually take responsibility for their own learning.

To enhance opportunities for students to learn, teachers:

- STRUCTURE THE CLASSROOM ENVIRONMENT, so that it is conducive to learning for all students.
- SELECT TASKS, so that they direct student learning toward fulfilling the five central responsibilities.
- FACILITATE DISCOURSE, so that they guide students to be proficient and independent thinkers.
- ENGAGE IN REFLECTION AND ANALYSIS, so that they continue to improve their teaching practice.

- COLLABORATE WITH OTHERS, so that they create a school community that meets the needs of their students and helps them grow professionally.

Elementary teachers structure the classroom environment along the physical dimension as well as the cognitive, social dimension. Teachers create, adapt, and manage many physical components of the classroom to better fulfill the five central responsibilities of the elementary school. They make sure that students have access to materials and that furniture is arranged so that students can complete learning activities. Teachers judge the readiness of their students to work independently with equipment and materials, and instruct them in safety when needed. Displays of student work celebrate previous learning. Book arrangements or learning centers encourage inquiry. A system for sharing classroom jobs helps to foster a sense of responsibility. Teachers arrange the classroom to efficiently support the full range of classroom activities and ease typical patterns of movement.

Teachers take steps to create and model norms in the classroom environment that encourage and nurture learning. Teachers use their knowledge of their students' individualities and age-typical behaviors as the basis of bringing them into a community of learners. The sense of community cannot be imposed. It develops as a voluntary coming together of the teacher and students. Students feel that they are welcome in the classroom. They believe that struggling with ideas is an essential part of learning, and not a personal failure. They learn constructive ways of disagreeing with others and to accept disagreement. Teachers guide the development of the classroom community by motivating students to participate in classroom activities, modeling desired thinking and behavior, using positive and negative reinforcement, and scaffolding development of necessary citizenship and academic skills. All these teacher actions are more effective when based on knowledge of individual students combined with clear ideas of learning goals.

Particular actions by teachers depend on variables involving individual students, grade levels, community factors, and school and district goals. Sometimes teachers provide time and support for students to move daily from a stressful environment, e.g., a dangerous neighborhood or a family undergoing a divorce, to full engagement in learning activities. Other times, teachers work to nurture student abilities, such as structuring opportunities to work independently or reducing debilitating levels of competition. In all situations, the goal is for students to feel some level of comfort with the classroom and the intellectual enterprise in which the teacher and students are engaged.

Student tasks include most of the activities that teachers try to engage their students in at school and at home. Some activities, such as writing a story or creating a poster that illustrates the food web in a particular ecosystem, are obvious learning tasks. Others, such as taking and recording the daily lunch count, may or may not be learning tasks, depending on current student knowledge as well as on how the task is conducted. Teachers take the responsibility to create, adapt, or select worthwhile tasks related to learning goals for their students.

Worthwhile tasks have several characteristics. They serve to involve students with work that relates directly to the concepts, skills and processes that are important to whatever central responsibility the students are working on. For example worthwhile reading tasks involve students in the actual process of reading or in practicing skills that are essential to reading. In addition, teachers select tasks that make appropriate representations of the concepts, skills, and processes being studied.

Teachers are responsible for the accuracy of facts and ideas in their tasks. They also strive to present important thinking processes, such as reading a biography or making a graph, in ways that are true to the spirit of their content areas.

Worthwhile tasks also encourage students to improve their knowledge or levels of performance. A task that only asks students to do something they have already mastered rather than offering challenge that might facilitate growth should be questioned. Teachers also take into account the achievement levels, present knowledge, and attitudes toward learning of their students so that they select and structure tasks that are accessible to them. A task will not encourage students to learn if they are unprepared for or unable to perform any of the steps involved in the activity. Teachers also select tasks that relate to the interests, values or experiences of their students so that the tasks are motivating and engaging for them.

Teachers use available resources to create or adapt tasks in many ways for their students. For example, they modify activities found in textbooks, or revise the content of an informational article, or add more challenging questions to a mathematics homework assignment for high achieving students.

Other adjustments are made when teachers take into account the types of assistance needed to support student learning. A graphic organizer to guide students through a cognitive process, or strategically chosen questions to provoke and guide student thinking would be examples of such types of assistance. Some student need strong support to complete activities, while others need additional challenges to extend their learning. Teachers consider how and when they can support the learning of individual students within the context of teaching the entire class.

The choice of tasks will be constrained by the resources available. Some teachers will be able to draw upon a wide variety of technology and other material; other teachers will face a limited availability of reference materials, manipulatives, or even paper. Regardless, teachers choose tasks to maximize student learning.

The tasks that teachers choose and the environment that they create sets a structure in which discourse occurs. Discourse includes the multiplicity of ways that students and teachers represent ideas and think, talk, agree and disagree about them. Teachers facilitate discourse with their students in order to accomplish several educational goals. Discourse helps students learn new ideas or concepts. As students talk, write, make models, or draw pictorial representations of their ideas, they clarify, broaden, and strengthen those ideas. Students understand the idea of an electric circuit by working with components to build their own, through seeing examples of closed, open or short circuits built by others, and by talking or arguing about them with their teachers and their classmates. Asking questions, using definitions, or suggesting, testing, and evaluating alternatives are some of the ways that discourse helps students to think about circuits in order to better understand them. Discourse helps students improve their performances of essential processes. Students attain competence in reading by doing reading tasks, but they improve even more when they think about their reading, as when they search for and find patterns in the ways that people use language to communicate their ideas. Discourse helps strengthen the mastery of skills. Students are prepared to improve their use of periods, question marks, and exclamation points when they are asked to defend their own usage, when they hear their classmates explain some of their decisions,

or when small groups of students explore the consequences of punctuating sentences in different ways.

Teachers structure discourse by various means. The physical arrangement of the classroom and the availability of materials encourages certain forms of discourse and discourages others. For example, small group interaction is fostered when students can sit near each other and at some distance from other groups. The presence of various manipulatives, books from different genres of writing, and opportunities to explore museums or natural phenomena outside the classroom provide representations that can be used in discourse. Classroom norms also structure discourse. Classroom procedures for turn taking help students listen and speak to each other more effectively. Disagreeing with a classmate's opinion without resorting to disparagement of that person is a skill associated with democratic citizenship, and a habit of mind that supports lifelong inquiry, as well as a rule that helps facilitate discussion in a classroom. A norm that views mistakes as an opportunity for learning rather than as signs of failure encourages students to explore their ideas freely.

To help make discourse meaningful, teachers manage cognitive factors as well. They model the correct use of symbols, terms, and thinking processes to illustrate for students how facts, ideas, or opinions are represented in various fields of knowledge. Teachers articulate their own thinking to students so that they can see how important processes like reading, writing, or problem solving work. As teachers listen to their students talk, read their writing, or watch them enact their thinking, they make comments and enlarge upon aspects of student talk or work to help students avoid simple mimicry of what they see or hear others do and move toward deeper understandings of important concepts or processes.

Discourse increases in complexity with the development of students, which affects the way that teachers manage discourse. Discourse for primary students or for students learning a new concept or process may be in the form of seeing their ideas represented in another, similar manner, or having the teacher name or describe their activity for them. For example, a teacher might help students to write a simple number sentence, such as $4 + 3 = 7$, that corresponds to a problem situation. She then names the equal sign for the students and also points out which parts of the situation the 4, the 3, and the 7 refer to. This discourse helps students to better understand what they are doing and therefore to be able to make generalizations, or to apply their understandings to new situations.

Older students might engage in discourse when standards of writing are applied to sample student work. Teachers and students can work together to rate aspects of a paper in relationship to stated characteristics of communication, paragraph and sentence structure, grammar, or elaboration of ideas. To help students understand the standards better, the teacher might focus a discussion on a specific aspect of writing such as alternative ways that pieces of writing can be organized for effective communication. As students critique writing samples, or suggest revisions to improve them, the teacher helps his students clarify their ideas or urges them to support their opinions more effectively. The thinking that accompanies this discourse helps students think better about their own writing and then to write better. As students become more proficient in using the standards, they can form peer editing groups that are less closely supervised by the teacher.

Teachers use discourse to help students think more effectively about what they are learning and doing. They think about their teaching in a similar way.

Teachers analyze and reflect on their teaching, both to take stock of the progress that they and their students are making and to improve their teaching. Teachers examine their teaching in the midst of instruction, adapting plans and activities according to student reactions. They use varied assessments of student learning as data to think about the extent to which they are accomplishing grade-level objectives and other important aspects of promoting literacy, developing numeracy, encouraging inquiry, building citizenship skills, and fostering habits of mind. They seek a balance between examining the progress of the class as a whole through the planned curriculum and examining the progress of individual students. Teachers think about how to assist particular students or groups of students, those who are unsuccessful as well as those who need more challenges. To guide the analysis of their teaching experiences, teachers draw upon a variety of theoretical cognitive, psychological, and sociocultural frameworks. For instance, a teacher might use her understanding of how children learn to read, her assessment of how a particular child feels about adults of a different race, and her analysis of this child's reading errors on a specific reading task to help her decide what steps to take next.

Teaching is a profession that has room for and encourages personal and professional growth. Teachers learn by talking with their teaching colleagues to share and analyze their efforts to fulfill the five central responsibilities and the resulting student learning. They also examine their teaching in light of new developments in curriculum and instruction. They seek out and use collegial conversations and debates, workshops and coursework, and professional journals to keep abreast of new tasks and materials, ways of facilitating discourse, and instructional goals that might improve their students' learning.

Elementary teachers also collaborate with others to meet the needs of their students, to contribute toward building a school community, and to grow professionally. They work with families, who provide a different and more long term perspective on individual students, to try to provide coordinated support at home and at school. Teachers consult with other educators. On an individual level, colleagues can be a rich source of ideas and information as well as a sounding board for identifying and solving problems. Specialists provide advice and cooperation in meeting student needs, as well as teaching expertise that broadens and enriches student learning. On a schoolwide level, teachers work with their peers and the principal to articulate instruction within and across grades and to achieve schoolwide goals. Often, this entails creating, examining, and revising school policies and practices to provide time for and to support collaborative activities as well as for individual teacher analysis and reflection. Community members provide additional resources, expertise, and examples of real world applications. Sometimes teachers link students and their families with medical, social or psychological services to help meet the noncognitive needs of children so that they are better prepared to learn at school. In short, teachers work with others to form a school community that works together on behalf of children.

Elementary Teacher Conversations

The five central responsibilities described in this monograph are intended to clarify instructional priorities and teachers' decisions and not to serve as an alternative framework by which to organize the school day. They can inform instructional decisions in many different school settings, including those where instruction is integrated across subject areas or where separate periods are set aside for specific subjects, such as reading or science class.

Using the five central responsibilities as a framework in which to conceptualize educational goals accomplishes the following: They help teachers set long term priorities, especially when teachers are trying to create learning environments. Among all the pieces of information that teachers know about their students, they help teachers focus on the data that relates to learning. They provide foci that help teachers choose from the plethora of possible student instructional tasks. They provide a support for educational problem solving and professional discourse.

As the school year progresses, teachers are thinking and talking about many different subjects. Some conversations take place in formal meetings of grade level teams; others in meetings of the entire school staff. At other more informal times, two colleagues may begin to discuss a specific situation or a beginning teacher may be discussing their day with their mentor. Teachers find that they return to many of the same topics over and over again as they talk about the questions and problems and issues that arise out of their classroom experiences.

The conversations that follow focus on teachers' roles as collaborative decision makers and describe conversations or deliberations between colleagues, rather than describing classroom events. They are accompanied by a commentary that points out connections to the main ideas about elementary teaching that have been presented already in the monograph.

Three first grade teachers, Mrs. Cesca, Mrs. Dutil, and Mrs. Oakleaf are having a team meeting with their principal, Mrs. Kurlantzick. They have planned to talk about student progress in reading with the Reading Support Teacher, Mrs. Sanders. The meeting is joined in progress.

VIGNETTE	***COMMENTARY***
Mrs. Oakleaf brings up her main concern. "I'm realizing that a large number of my kids are going to need extra support in learning how to hear sounds in words and to recognize their corresponding letters."	
"What do you mean? What are they doing or not doing?" asks Mrs. Kurlantzick.	
"You notice it when we read a poem like "Alligator	

Stew" on the big chart in unison. I ask them how we know that it is alligator stew and not alligator pie. I'm looking for somebody to point out that pie would start with a "p" or that the word that I'm pointing to begins with an "s." Many kids cannot complete that task right now."	*Mrs. O. refers to skills that are a part of the larger reading process.*
"I know what you mean," says Mrs. Dutil. "You can also see it in their invented spelling. Many students are stringing letters together randomly."	
Mrs. Sanders says, "It seems like many of the children are not yet responding to visual aspects of print."	
Mrs. Kurlantzick says, "It's only the last of September. Isn't it typical for some students to start first grade every year with a similar performance?"	*The discussion now focuses on where specific student performances stand on the developmental range of emerging literacy.*
"Yes, says Mrs. Cesca, "but it seems to be more prevalent this year. I have eight students who do not recognize all their letters. I was noticing their performance on the letter identification assessment. Here are the results. Last year, I had maybe three students who did not recognize their letters."	
"Let's remember that these kids are really not out of the normal range of development," says Mrs. Sanders. "We can wish that they were further along, but now we really need to think about how we can be helping them first hear sounds in words and second hear those sounds in sequence."	*It seems to be helpful to look at the student work from several perspectives as the team of teachers tries to come to their best understanding of the situation.*
"What do you think we ought to do about this?" asks Mrs. Dutil.	
Mrs. Oakleaf responds, "I think we have to put more emphasis on the phonics aspects of language instruction. So with my class, we're generating lists of all the words we can think of that start with the same letter."	*The teachers address the question of how best to promote literacy for their students. Recognizing*

Mrs. Cesca says, "I think that, in general, my class is better at understanding meaning this year. They can tell me that alligator "stew" makes sense because the poem is about food. So they are able to use context to help them understand the poem. That is probably what Michelle and Tracy have been emphasizing in kindergarten."	*letters of the alphabet, hearing sounds in words, using context clues to help make meaning are all part of a central responsibility.*
Mrs. Dutil says, "I think that's true for my class also. They use pictures and other contextual clues very well, so maybe some kids haven't really needed to call on phonics yet."	
Mrs. Kurlantzick says, "I wonder if we need to talk with Tracy and Michelle to see if we can better align the kindergarten program and the first grade program. Should we ask the kindergarten teachers to do more phonics instruction?"	
"They can't be asked to do everything," Mrs. Oakleaf says. "Maybe many of these particular kids took in as much as they possibly could	
about sound-symbol relationships last year. More phonics work might have made no difference, except that they wouldn't be as good at reading for meaning as they are now."	
"Are you saying to dismiss phonics? If you are, I disagree. How can we expect our kids to read without being able to decode words or parts of	*Even though different teachers hold conflicting opinions about key issues, their discussions take place within a framework*
words? We need to find a way to balance the approaches so that kids get what they need to succeed."	*of promoting literacy.*
"Actually this discussion is really helping me to understand my original problem better," says Mrs. Oakleaf. "Neither phonics nor using context clues is an end in itself. We know that readers need to be able to do both. Rather than change our whole reading program, I think we ought to concentrate more on activities to help students learn phonics relationships while they continue to use their abilities to use context clues."	

Mrs. Sanders says, "We are zeroing in on what these kids know and can do. Our instruction changes each year with the kids. As we look at student performance over the years, we may find that we need to change our program. We'll have to see what happens."	*Teaching decisions come out of a picture of what the students know and also a picture of where teachers think they ought to go.*

Ms. Jaksina, Mrs. Yung, and Mr. Baccaro teach a team of 80 fifth graders. The three teachers consult with each other about curricular goals, teaching strategies, and different issues or problems that arise during the course of the year. This conversation takes place during an afternoon planning period.

"Tony, what happened with Michael at recess?" asks Ms. Jaksina. "When he finally got to math class, he looked pretty sad. The kids said he had a fight, but I couldn't get him to tell me anything about it. He still looked pretty gloomy when I dropped them off at music."	
"We had a bad fight on the playground today. Kids started yelling and by the time I got there, Michael and Jason were wrestling and hitting each other. I sent them to the office."	*The teachers begin by talking about the behaviors of several specific students. Their conversation shifts to the central responsibility of building citizenship.*
Ms. Jaksina says, "I had to break up a fight yesterday. But do you know what the really bad part was? A bunch of other kids made it much worse. They were teasing poor Carlos and really encouraging Adam to hurt him. We have a lot of fights and arguments this year and they are pretty nasty ones."	
Mrs. Yung points out that this is not a new problem, that "we have had to deal with it for the last several years." She asks if they can see any patterns that might help explain why	
there are so many fights with this particular class. "We should do something, but the something depends on what we think the causes are." "Maybe we just have to be stricter out there," suggests	*The team members explore the situation together. They offer alternative explanations of the causes.*

Mr. Baccaro.	
"Perhaps we do, although more supervision doesn't necessarily help them develop any conflict resolution skills. Maybe we have too many kids who don't know how to get out of conflicts once they get into them."	*Two responses are proposed. The first is related to managing the environment through closer supervision*
"Is it a case of one or two individuals who are causing a lot of the situations? Is there an instigator among us?" asks Mr. Baccaro.	*The second is related to building students' citizenship skills.*
"Maybe we should start logging a record of these incidents to see if any patterns emerge." "I think we ought to work with the whole group. We can present each of our classes with what we are seeing and ask their opinions on what the problem is and what should be done about it. I don't think we'll make much progress with this until enough of the kids take on some responsibility for the situation."	*Ms. J. wants to gather more information about the problem.* *Mrs. Y. suggests a series of tasks during which the students will apply inquiry skills and processes to a problem in their school community.*
"It's not only a fifth grade problem, if you ask me. This is really an issue for the whole school. I'm going to talk to the Principal about this. Maybe the whole staff should take it up." The team agrees to bring up the question to the whole faculty as well as to develop strategies they can implement for the fifth grade.	*Placing the issue in front of the whole faculty seems like a good start to a possible consideration of how the school could work to promote better citizenship.*

Ms. Vygotsky is teaching third grade for the first time this year. After school one day, she asks her partners, Mrs. Dewey and Ms. Beecher, about teaching science and the science curriculum.

"According to the curriculum guides, I'm supposed to teach three big science units in addition to all this material on drug education and health. I don't see how I can do all of it. It's going to take me months to finish the unit about plants!"	*The proliferation of curriculum. There seems to be too much to teach.*
Mrs. Dewey responds, "I don't do every lesson in the guide. There just isn't enough time. I think you can try to cover a part of the material under each topic. If you	*Despite being directed by extensive curriculum materials,*

want, I could look at the units with you and maybe we could choose some lessons to do while others are skipped."	*teachers must choose some instructional tasks over others.*
Ms. Vygotsky says, "I haven't even considered skipping anything. I didn't think they would let me do that."	
"I try to focus on one or two big ideas myself. What are you doing in the plants unit now?" "We are soaking seeds and watching them to see if they sprout. We have planted some seeds in little planters. We are going to put some plants in the dark and some in the light to compare their growth, I think," explains Ms. Vygotsky.	*Part of Ms. V's problem may be that she is looking at a large number of student tasks without having a way to organize them for her thinking and planning.*
"I'd say that there are several questions you want to know about your class," Mrs. Dewey says. "What do your students know about seeds? Do they know how they sprout? Do they have an idea about the life cycle of the plant from seed to sprout to green plant to flower to seed? Do you think they understand anything about photosynthesis?"	*What students already know about the content should inform any goal setting decisions. Mrs. D. suggests that Ms. V. assess her students' knowledge.*
"They are familiar with seeds, but there are a lot of things they don't really understand about them. Probably the same is true about the life cycle," responds Ms. Vygotsky. "To tell you the truth, I've been worrying about covering the curriculum. I think I see what you mean, though. If I knew what the kids knew about this topic, I could focus on what they need."	*Mrs. D doesn't suggest that Ms. V. select a*
"Right. Having an idea of what they know and don't know will help you choose some activities and eliminate others. Perhaps an examination of seeds and how they sprout would be really good for most of the kids in your class.	*student activity just for the sake of choosing. Rather she starts by asking two questions: what do students already know and what should they know?*
Ms. Beecher joins the conversation. "I think that Roberta's ideas are good, and I agree that you need a way to set priorities in your curriculum. Another way to look at this situation is to focus on scientific inquiry and	

scientific habits of mind. That's the real purpose of the science curriculum if you ask me. We want kids to start asking questions about the natural world, to think of ways to answer those questions, to gather data, and to interpret that data." Mrs. Dewey replies, "What about understandings? You can't just skip all the ideas and the skills."	*Ms. B. suggests an alternative way to think about Ms. V.'s problem. She focuses on the central responsibility of encouraging inquiry.*
"Personally, I think that these kids will have plenty of opportunities to learn important concepts about plants in 5th, 7th or 10th grades. What they need is to start developing some scientific habits of mind. I would choose a part of the plant study that would really allow you to start working with your class to help them carry out some scientific inquiry."	*Ms. B. also selects student tasks, but she uses the goal of encouraging inquiry to help guide her choice.*
"Ms. Vygotsky says, "Yeah, but they are so young. Are you asking them to set up experiments, control variables and record data scientifically and stuff like that?"	*The question of what students know and what they are able to do arises again.*
"Ms. Beecher replies, "You're right. They're certainly not ready to meet adult scientific standards. But we can ask ourselves, "what should they be doing and thinking about now that will help them develop those abilities?"	
Ms. Vygotsky says, "I really don't know what they are capable of doing along those lines."	
Ms. Beecher asks, "Couldn't they ask some questions about sprouting seeds or growing plants? If so, you might be able to spent some time with the whole class devising several little "experiments" that might answer a certain question. You could model how to devise an experiment for beginning scientists."	*Ms. B. proposes a student activity as well as discourse to accompany it.*
Ms. Vygotsky expresses some reservations about organizing the classroom and controlling student behaviors during "inquiry." She also worries about the consequences to her for not doing parts of the curriculum guide.	

Mrs. Dewey and Ms. Beecher continue to debate the question of whether to set their goals on important ideas or the process of scientific inquiry. They find themselves agreeing that they may be able to keep both kinds of goals in mind as they focus on rich student activities and meaningful discourse.	

These hypothetical teacher conversations, which highlight teachers' roles as educational decision makers, illustrate how the five central responsibilities of elementary schools can inform discussions about teaching and learning. Even when these teachers do not talk about the five central responsibilities specifically, they are primarily concerned with questions that directly relate to them. If these teachers had been able to place their concerns explicitly in the framework of the five central responsibilities, it might have enabled them more easily to relate analyses of problems and alternative courses of action to priorities of teaching and learning.

The conversation vignettes illustrate how the Five Central Responsibilities can be used to understand teacher decisions about issues as they arise. The responsibilities also can be use to understand, inform, or evaluate instruction in any subject area. To illustrate how this might be done, we focus on instruction in language arts, mathematics, social studies, science, and the arts.

Developing the Five Central Responsibilities Through Language Arts

Knowledge of language arts skills, processes, and concepts provides students with the tools to study all other areas of the elementary curriculum. As students respond to both fictional and nonfictional texts, they learn to obtain information, develop empathy, and learn about alternative ways of seeing the world. They engage in public discourse about what they have read, heard or viewed. Working out their own interpretations and hearing the interpretations of others teaches them the power in making connections between texts and their life experiences. Language and literacy become important personal tools for communication, enjoyment, insight, and life-long learning.

Language arts instruction promotes literacy. Through language arts instruction students develop skills in the areas of reading, writing, speaking, listening, viewing and enacting. Students learn to use all three cueing systems (letter-sound correspondence, grammar, and context), and to use their previous knowledge to construct meaning from printed, oral, and visual texts. Conversely, students learn to compose messages in printed, oral and visual texts to fit their purpose, the task and the nature of the audience. Language arts instruction emphasizes various metacognitive skills involved when constructing meaning, such as, internal monitoring of understanding, summarizing, or drawing inferences. Exposure to the many genres of language arts helps students identify numerous means of personal expression and provides stimuli for student writing activities.

Language arts instruction develops numeracy. Students use reading, viewing and listening competencies to help them analyze and comprehend problem situations. Better comprehension leads to better problem solving performance. Logical and mathematical reasoning are not only communicated with language, but are actually conducted through the media of spoken and written

language. The same processes used to make meaning out of printed texts are used to interpret the significance of quantitative data represented in mathematical drawings, symbols, graphs, and tables.

The ability to recognize, develop and state legitimate arguments to support various positions is a language skill that can and should be transferred to mathematical situations. Mathematical thinking is always strengthened by the precise use of spoken and written language.

Language arts instruction encourages inquiry when teachers help students develop and choose among alternative expressions of their ideas and interpretations of various texts. Students develop their own purposes for reading and writing, asking and answering their own questions about composing and interpreting written texts. Emergent readers learn how to figure out the meanings of unfamiliar words through some combination of decoding and clues from grammar and context. As they increase their control over writing, students build up a repertoire of increasingly sophisticated strategies for evaluating and improving their writing. Students also learn ways of responding to the texts that they read or listen to. They might speculate about the impact of particular language or images on emotions or behavior. They form their own interpretations of texts and search for supporting and non-supporting details as they reread or listen again. Since reading, writing, speaking, listening, viewing, and enacting are the media through which teaching and demonstrating learning are conducted, being able to conduct inquiry in language arts is central to being able to conduct inquiry in other subjects.

Language arts instruction builds citizenship skills. As essential as the basic skills of reading, writing, speaking, listening, viewing and enacting are to the language arts, it is only through public discourse that these skills are activated and given meaning. Students can help create a sense of a learning community by engaging in shared interpretations of the same text, and by using peer evaluation of their work. They can learn the importance of recognizing different view points and accept the diversity of interpretations that will be evident in a classroom. Literature, plays, poems, television shows, and movies can provide links for students to the wider society. Through these language experiences they can develop empathy, understanding, and a sense of caring for others in their local communities and in communities around the world.

Language arts instruction fosters the habits of mind that support learning. It is not enough for students to have the cognitive skills to understand language and construct meanings. In creating learning opportunities in language arts, teachers strive to nurture curiosity, multiple perspectives, self monitoring, persistence, flexibility and responsibility. Students, in order to become truly competent language users, must make language their own. Students need to realize that language is the primary cognitive vehicle we have for expressing and satisfying our curiosity. By encouraging students to own and continually enhance their language arts skills, teachers establish a foundation for life long learning.

Developing the Five Central Responsibilities through Mathematics

Like language arts, mathematical knowledge and skills provide a foundation for inquiry and learning in other content areas. Through mathematics instruction students learn to apply their

knowledge of numbers, spatial relationships, and working with data to solve problems like those they are likely to encounter in their lives.

Mathematics instruction promotes literacy. The special contribution of mathematics in promoting literacy is in providing opportunities for students to use the language of written symbols to read, write, and explain their thinking. Students learn to move back and forth between different forms of communication, such as symbols, drawings, concrete models, words, and role play. They develop skills in using logical reasoning to construct arguments when speaking and to follow and interpret arguments when listening. When teachers facilitate math discussions, they help students build clarification skills, use terms and definitions precisely, and develop ways to test conclusions and assumptions.

Mathematics instruction develops numeracy. Elementary students need to develop the abilities to use numbers, to deal with data, and to use spatial relationships. Through ordering numbers and associating them with familiar objects or situations, like the number of students in their classroom or the number of peanuts in a package, students develop a sense of the relative magnitude of numbers. Among other applications, this helps them understand and use measurements, especially measures of money, time, weight, and distance. Mathematics instruction helps students learn to use different kinds of numbers, primarily whole numbers, fractions, decimals, ratios and percents, to describe and interpret the world. They also learn when and how to use addition, subtraction, multiplication and division to solve problems. Students learn how to make reasonable estimates of numerical answers and develop a sense of how precise their answer needs to be. They also learn to use numbers to represent the likelihood of different events.

Students also learn to deal with data. They represent and interpret numbers and trends through graphs, charts, and other visual representations. They learn different ways to summarize groups of data, by representing values or ranges of numbers visually or through statistics like average or median. Through mathematics instruction, students also learn about spatial relationships. They learn about the names and properties of common shapes used to describe space. They develop a sense of the ways that these two- and three-dimensional shapes can be combined or separated to form new shapes and applied to engineering, architectural or measurement problems. As students work with numbers, data, and shapes, they learn to create, see, and extend patterns and relationships, which facilitates the development of inquiry skills.

Mathematics instruction encourages inquiry. Mathematical inquiry depends on skills of logic and reasoning, including identifying assumptions and extending and connecting previous knowledge. Students use numbers, data summaries, and spatial concepts to describe, explore, and evaluate claims. Mathematical instruction aims to help students develop repertoires of different ways to represent problem situations as well as different ways to construct arguments. Mathematics can teach students to be cautious about making generalizations, as they find that a given pattern can sometimes be extended in more than one way. Through mathematical explorations, students can be introduced to the use of technology such as calculators and computers to aid in inquiry.

Mathematics instruction builds citizenship skills. Solving math problems in groups provides a model for democratic discussion and decision making, where a value is put on sharing interpretations of evidence and choosing next steps based on agreed upon interpretations.

Mathematical discussions are a forum in which students can learn how to propose original ideas, defend arguments, and disagree with others constructively. Students learn to draw conclusions from data to work toward a consensus for collective action.

Mathematics instruction fosters the habits of mind that support learning. Encouraging students to ask and explore their own questions using numbers or spatial concepts rewards curiosity. Mathematical problems that students find challenging but solvable help develop persistence and flexibility, as students become used to trying different approaches to problem solving until they find one that works. Because mathematics often lends itself to evaluating an answer or an argument, students can check their own solutions and check those of others independently of the teacher, which helps develop self-reflectiveness, self-reliance, and independent thinking.

Developing the Five Central Responsibilities Through Social Studies

Through the study of the social sciences, students learn about their social world and the social worlds of others: past and present, local and distant. Knowledge and skills drawn from the social studies help students learn citizenship. This includes learning how to work with others and helping students appreciate the significance of their membership in various social communities.

Social studies instruction promotes literacy. Social studies provides the conceptual tools to understand and interpret human behavior, both in groups and individually. Knowledge of geographical, historical, and other social science information helps provide background data which can be used to understand events and characters encountered in fictional, biographical and nonfictional materials. By reading historical fiction, students can both understand the differences between fiction and nonfiction, and improve their understanding of the historical events portrayed.

Social studies instruction develops numeracy. Social studies investigations often involve the collection and analysis of data. Having students compare the size of populations found in different towns and cities can help strengthen students' sense of numbers. Opportunities to use maps, charts, tables, and graphs to organize, interpret, and report social science data reinforces student understanding of percents, ratio, and scale. Spatial relations skills are enhanced by having students construct and interpret maps, timelines, and schematic diagrams. For example, students apply the coordinate concepts of latitude and longitude to locate and identify places on maps and globes.

Social studies instruction encourages inquiry. Social studies provides opportunities for students to practice inquiry on subjects or topics that are of high interest, namely, themselves, other people and human situations of all types. Through individual and group investigations of past, current, and future social issues students develop and refine their critical thinking skills. While exploring primary and secondary sources of data, students think about how to evaluate and use evidence. In discussing current events or how to resolve disputes between classmates, students develop their decision-making skills by identifying alternatives and making reasoned choices from among them. As students study topics from a variety of social studies perspectives (i.e., historical, geographical, economical, psychological or sociological), they learn how to integrate knowledge gained from different sources.

Social studies builds citizenship skills. The classroom provides a direct experience for students to learn cooperation, treating others with respect, and managing conflicts in a non-aggressive fashion. Engaging students in the framing of a classroom constitution or classroom rules can reinforce a sense of community, a respect for authority, and the importance of individual and collective responsibility. Democratic participation can be experienced through group problem-solving situations where students need to vote, to present opposing opinions and to stand up for what they believe. Geography, history and other social sciences can help students understand their place in the world and their interdependence with others. Respect for diversity can be enhanced through many social studies activities that explore how culture, history, and geography affect people's lives. As part of this study, students learn about historical events, landmarks, and works of art that are widely known an valued in their community. Community service projects can provide opportunities for students to directly contribute to making their world a better place to live for themselves and others.

Social studies instruction fosters the habits of mind that support learning. Children are very curious about themselves and their communities, providing opportunities to indulge and develop the habit of curiosity through study of social studies information and ideas. Many social studies topics are particularly well suited to developing the habit of looking at ideas and events from different perspectives, whether it be from the perspective of different people, different times or from different social studies branches. These different perspectives also foster a willingness to change one's mind given new data, as students reexamine the same situation from additional perspectives.

Developing The Five Central Responsibilities Through Science

The interest students have about the physical and biological world can be used to accomplish the five central responsibilities as well as to develop a stronger understanding of scientific content and processes. Science content and procedures help structure investigations of topics that are interesting and meaningful to elementary students.

Science instruction promotes literacy. Because science emphasizes accuracy and elaboration when describing or explaining, students can develop their vocabulary and language skills. Opportunities to share their observations, predictions, and conclusions with others helps students develop and refine their written, graphic, and verbal communication skills. Through the process of scientific examination students are encouraged to engage in logical thinking and to communicate this thinking to others. Science is a significant source of nonfiction reading material and writing opportunities.

Science instruction develops numeracy Students develop their abilities to use mathematics, the symbolic language of science, to represent, analyze, and report data from their investigations. The use of graphs, charts, and perhaps basic formulas to represent findings and ideas can serve as the basis of discourse to improve students' mathematical thinking. Scientific investigations involve students in measuring, quantifying, qualifying, classifying, and comparing data that they and others will rely on, and thus, extend mathematical reasoning skills. Open-ended science problems also help students develop inductive and deductive reasoning skills.

Science instruction encourages inquiry. The process of inquiry is at the heart of the scientific enterprise. Through science students can learn the importance of asking good questions, finding ways to gather, analyze, and report data, and to draw conclusions based on these data. Classroom experiments can provide opportunities for students to develop structured and non-structured methods of inquiry. By designing and completing their own scientific investigations, older students can learn the different stages and decisions associated with the inquiry process.

Science instruction builds citizenship skills. A hallmark of scientific experimentation is that it is always shared with others so that the results can be verified and ultimately used for the common good. By exploring science as a member of a team, students can realize the importance of one's own contribution to the endeavor and the value of collective input. By having students offer different interpretations and ideas about how the investigation should be organized and executed, students will have the opportunity to realize the power of working with others. Through the study of ecology and the life sciences a bridge to the natural world can be fostered. Helping students understand how to care for nature can be used to highlight our responsibilities as inhabitants of the earth. Both group projects and the study of ecological issues can help develop a sense of interdependence for elementary students.

Science instruction fosters the habits of mind that support learning. Through experimentation activities in science, students learn to value curiosity, persistence, the importance of pre-planning, how to deal with ambiguity, the importance of respecting reason and being honest. When listening to the results of investigations they have the opportunity to learn to value skepticism, how to rely on data to draw conclusions, and to accept a multiplicity of interpretations from one set of data. Work in science provides a situation where students can feel the magic of following through on one's own questions about the world and having the process, results, and conclusions validated by others.

During scientific investigations students can also realize that others will be pursuing the same idea but in a different way. When students reach obstacles or unexpected findings in their investigations they will have the opportunity to see the importance of being willing to modify their processes and explanations. By allowing students to design and follow-through on their own investigations, science instruction can provide a foundation for life-long, independent learning.

Fulfilling the Five Central Responsibilities Through the Arts

The arts -- dance, music, theater, and the visual arts -- provide students with essential ways of knowing and describing their world. A large part of learning involves taking in information through the senses. The study of the arts enhances students' capacities for learning by heightening sensory awareness and sharpening perception.

The arts also cultivate imagination, the capacity for forming mental images. The ability to translate ideas from one form of thinking, such as verbal, to other forms, such as pictorial or three dimensional physical expressions, helps people complete many different kinds of tasks, especially tasks that require translating ideas into action or action into pictures. In addition, imagination helps

students to picture or represent ideas in ways that enhance understanding. The abilities that are developed through the study of the arts help all students to make important translations and comprehend at higher or deeper levels.

Thinking takes place in many forms, only one of which is verbal. The arts provide methods of thinking and communicating in a wide variety of nonverbal images, including both visual and aural. For students who excel in such nonverbal forms of communication, the arts can provide a disciplined means of expression of their perceptions, thoughts, and feelings. Connecting the arts with other subjects provides motivation for these students to learn and helps all students gain access to different kinds of knowledge. Students understand themselves better, and make connections to their communities, and other people around the world through the arts.

The role of the arts in schools takes three forms. Learning in the arts prepares students to create, perform and evaluate works of art. It involves both knowledge of the central principles that are used to make and appreciate that type of art as well as an awareness of the characteristics of the materials or media employed. At the present time, few classroom teachers have the depth of knowledge for this instruction, which is why the arts are taught by specialists in Connecticut schools. Learning about the arts provides opportunities for connecting with learning in other subjects. For example, analyzing common forms in visual works of art by different artists provides an aesthetic context for applying knowledge of geometry. Music history provides an aural context for learning about change and continuity. Learning through the arts is the use of the arts as multimedia, multisensory ways of delivering instruction in other subjects. The process of dramatizing a story or a historical event, whether in first grade or fifth grade, is a natural avenue for better understanding the story or event. Elementary classroom teachers collaborate with specialists to plan and deliver instruction in the latter two forms of arts instruction.

Arts instruction promotes literacy. For example, students learn to use the vocabulary and syntax of images as they learn about and produce various art forms. They use various media to communicate and interpret meaning and to articulate artistic goals. Early readers and writers use the illustrations that accompany text to help them learn how to read and write. Readers of all ages and levels of proficiency interpret drawings in math, social studies and science textbooks to help clarify text. Producing pictures or models as part of their science, mathematics or social studies writing helps students to better understand concepts and to communicate their understandings. Students reflect on their own performances in writing, making translations between words and imagery.

Arts instruction develops numeracy. The arts provide a visual and aural context for learning mathematical concepts and procedures. Students discover and explore patterns and symmetry through musical rhythms and the compositions of paintings. They use knowledge of geometry to describe and analyze movement in dance. Students encounter applied fractions in musical notes and measures. Students also apply artistic understandings to their mathematical work. They use their knowledge of color and principles of composition to construct data displays that communicate effectively. They use drawings, models, and dramatizations of mathematical problems and situations to inspire solutions and illustrate mathematical ideas.

Arts instruction encourages inquiry. In producing their own artwork, students engage in a cycle of imagining and experimenting, performing and making, perceiving and reflecting, reconsidering and

revising. They solve problems associated with: creating visions; finding media that enable them to communicate those visions; working with specific properties of a chosen medium; and interpreting aural and visual images created by others.

Arts instruction builds citizenship skills. Students use the art of other people, other times, and other places to build a more complete understanding of how others perceive the world. Students learn about the heritage of the state and the nation by experiencing common artistic images that hold us together. Student performances and exhibitions of artwork provide opportunities to develop and maintain a sense of community in the classroom and the school. Students develop skills in collaborating toward common goals in an interdependent, noncompetitive setting offered by the arts.

Arts instruction fosters the habits of mind that support learning. Students learn to understand art works using trained perception, articulating and defending reasoned judgments. Because the arts lend themselves to interpretation, students can learn to improve their abilities to evaluate alternative interpretations. The arts provide a unique opportunity for students to value and strive toward clarity and aesthetic beauty. Students have opportunities to develop poise when presenting finished work to others. They develop the habits of looking and listening carefully. The satisfaction associated with finally learning a piece of music or completing a sculpture helps students learn to persevere.

The five central responsibilities help teachers both evaluate their teaching actions and prioritize their teaching alternatives. For example, one of the reasons we teach science is to promote literacy. Another reason is to encourage inquiry. We do not teach mathematics just for the sake of mathematics. We teach math in order to help our students develop mathematical thinking, to promote student literacy, and to foster the habits of mind that support lifelong learning.

During a perfect day of teaching elementary school, every interaction with a student could be seen as helping to accomplish one or more of the five central tasks. During self reflection, a teacher might ask a series of questions like these:

- Am I teaching spelling in ways that promote literacy?
- Am I teaching health in ways that encourage inquiry?
- Am I creating classroom routines that help develop numeracy.
- Am I disciplining students in ways that foster habits of mind that support learning?
- Am I teaching mathematics in ways that help build citizenship skills?

We believe that keeping the five central responsibilities in mind as curricular and instructional choices are made and implemented will help elementary teachers in any school stay focused on what is truly important.

Conclusion

Our vision of elementary school contains no prescriptions about tried-and-true instructional techniques or materials, instructional groupings. Instead, we focus on identifying important student learning in the elementary years, what is important to know about students, and what is important to focus on in teaching. Our vision views teachers as professionals who know their students, their content, their teaching context, and their district curricular goals. They experiment with their instruction and constantly adapt materials and strategies used in the past to the needs and interests of their current students. They reflect on their teaching and work with others to improve instruction.

The public depends on teachers competence and commitment to improvement because there are no "teacher-proof" strategies or materials. We think that this is what makes education an interesting and challenging vocation.

Elementary teaching and learning should be centered around teaching students literacy, numeracy, inquiry processes and skills, citizenship skills, and habits of mind. Teachers should be able to use developmental, individual and sociocultural perspectives to think about how students act and how students learn, both in general and with respect to their particular students. They use that knowledge along with knowledge of content and how to teach it to construct a positive learning environment, select tasks, facilitate discourse, reflect on their teaching, and collaborate with others. No teacher ever completely accomplishes any of these tasks. Students can always learn more. Teachers constantly make new discoveries about students and how to teach them more effectively.

The challenge is to adopt policies that encourage and support teacher growth and the dissemination of particularly effective practices for other teachers to consider. Toward that end, we hope that this monograph stimulates conversations around policies and practices at the school, district, and state levels. Although initiated as part of the development of a system of support and assessment for beginning teachers, we defined our task more broadly to address elementary teaching and learning in general. Just as we advocate tasks for students which they can enter at different levels of understanding, we hope that this monograph will be useful to both beginning and experienced teachers, who will construct different meanings according to their different degrees of sophistication.